Chapter 4

Developing countries and increased exports: contexts and challenges

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Introduction

This chapter presents reflections on how the partnerships of the Brazilian Agricultural Research Corporation (Embrapa) contribute to increasing the exports of developing countries. Therefore, it addresses initiatives in the context of target 17.11 – "significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020" (United Nations, 2018), which is part of Sustainable Development Goal 17 (SDG 17).

Knowledge exchange and trade between countries are ways by which global partnerships lead to sustainable development. By expanding their export capacity, the least developed countries are taking further steps towards growth and development. This is because access to international markets leads to income and employment generation, whose multiplier effects impact the whole economy. Thus, if the grain sector of a least developed nation is able to export, for example, more people are hired in that sector; thus, their income enters and broadly moves the economy via consumption. Income from exports can also be used to increase domestic savings, which may result in greater investment capacity in the future. In addition, being a product supplier to international markets encourages countries to modernize their export sector in order to be more competitive in terms of quality and price. Lessons and technical progress come as a consequence of this modernization.

However, a least developed country that seeks to enter the international market by selling its products faces a number of difficulties. The first one is to produce surpluses, which does not always happen. Once this issue is overcome, exportable surpluses need to achieve competitive added value, quality and price standards. In addition, in the case of agricultural products, having storage and logistics infrastructures and skilled workforce, and overcoming specific international trade restrictions (such as tariff and non-tariff market barriers, and participation in

international agreements) are required. Accessing technologies and knowledge is essential in this process and may be beneficial, especially because it leads to higher process efficiency, reduced production costs, improved product quality and higher workforce capacity. If these factors are not taken into account, entering in the international market becomes difficult, as currently seen in relation to the least developed countries.

Agricultural research and innovation institutions can help least developed countries improve their production systems and, thus, move towards achieving food security and poverty reduction while, at the same time, being able to export. In this context, Embrapa can contribute with over 2,500 technological solutions (among validated and qualified products, processes, services, methodologies, agricultural practices and systems) and with climate (ecosystems and agricultural practices similar to those of many least developed countries in tropical areas). Thus, it is clear that Embrapa has much to share in terms of technical cooperation. Just as Embrapa has contributed to transform Brazilian agriculture, it may help encourage a similar transformation in the least developed countries.

Contributions to increase the exports of least developed countries

Embrapa has been one of the main Brazilian parties in international cooperation in agriculture. After the rapid evolution of Brazilian agriculture, from the end of the 1990s, Brazil also began sharing knowledge through capacity-building programs for technicians from developing countries (especially Latin America and Portuguese-speaking countries of Africa) and through development support projects, coordinated by the Brazilian Cooperation Agency (ABC) of the Ministry of Foreign Affairs.

Since 1998, ABC has coordinated 352 projects in agriculture within the framework of South-South cooperation. These were technical cooperation projects to varying extents, some focused on capacity-building and technical visits, others on technology development, introduction of higher-quality genetic material or strengthening of production systems. Embrapa joined 190 of these projects as the main Brazilian party. Most of these cooperation initiatives are based on the fact that these countries grow the same species as Brazil under similar soil and climate conditions, but with less structured production sectors and with low technological development.

In addition to projects demanded by Brazilian diplomatic commitments, Embrapa has opened cooperation offices in Venezuela, Panama (Embrapa Américas) and Ghana (Embrapa África) as part of its internationalization. These offices were designed as direct channels to contact national research and extension institutions and support the Brazilian diplomatic structure. In addition, scientific cooperation with countries of the South has also been strengthened over the last years.

In an important South-South cooperation action, Embrapa and a number of national and foreign partners established the Africa-Brazil Agricultural Innovation Marketplace (MKTPlace), through which African institutions observed their own demands and annually had the opportunity to present projects in cooperation with Embrapa Research Units. It was, thus, a completely horizontal process. Later, this platform was expanded to include Latin American and Caribbean countries. In 2016, the United Nations Office for South-South Cooperation (UNOSSC) recognized MKTPlace as one of the most effective cooperation strategies in the world. As a continuation of developing cooperative processes, a new phase for project support was started within MKTPlace in 2016: it was called Building on the Successes of the Marketplace (*M-BoSs*). Chapter 5 of this book details MKTPlace and M-BoSs dynamics.

In this context, some initiatives have already started contributing to expand the exports of least developed countries and deserve mention. Two of them were performed within MKTPlace and, because of their positive results, were selected to be continued in M-BoSs. The first initiative deals with bee diversity and honey production for food security in Ethiopia; the second, with small farmers' increased production of cowpea in Ghana by using symbiotic nitrogen fixation.

As a partnership between Embrapa Acre and the University of Mekelle, in Ethiopia, the honey production project was run in two phases: the first between 2011 and 2013 and the second (lasting 3 years) from 2017 to 2019. According to the Agricultural Growth Program of Ethiopia, the role of beekeeping for sustainable development in different agro-ecological zones is widely recognized, as beekeeping is less affected by drought than other activities. There are approximately 1.5 million beekeepers in the country. In terms of honey production, Ethiopia ranks 1st among African countries and 10th among all countries in the world. In terms of exports, Ethiopia ranks 2nd in Africa and 46th in the world (FAO, 2013). The beekeeping sector is far from reaching its potential in the country, mainly due to the low level of technology, which reduces the competitiveness of Ethiopian honey.

The initiative undertaken jointly by the University of Mekelle and Embrapa allowed the molecular and morphological identification and characterization of bee species of the genus *Apis* kept in the apiaries and the physical-chemical and microbiological characterization of properties of honey produced by local beekeepers. Additionally, beekeeping Demonstration Units were installed, production capacities of queen bees were improved (Figure 1) and events to present, disseminate and discuss the results achieved were held. Advances were easily incorporated by beekeepers and continued to be passed on to other local producers. In its first phase, the project helped lay the foundations for a center of excellence in bee research in Ethiopia.

In its second phase, the project aims to promote a 20% increase in honey production in managed colonies and train 1,500 beekeepers and 17 professionals from partner institutions. Five Ethiopian professionals will be trained in beekeeping in Brazil. Together with the community and local institutions, the most productive colonies will be selected, multiplied and distributed. It is expected that trained beekeepers and improved local food security will positively influence other

Photo: Mohammed Tilahun Tessema

Figure 1. Ethiopian beekeepers replicating techniques learned in capacity-building course jointly conducted by the University of Mekelle and Embrapa Acre.

beekeepers in Ethiopia, thus contributing to implement the National Agricultural Transformation Agenda currently in force in that country, which includes the development of domestic and export markets as one of its main goals.

The project for increasing cowpea yield in Ghana is an initiative carried out within MKTPlace and continued as part of M-BoSs and stands out for potentially contributing to expand least developed countries exports. The Embrapa team had developed a technology using an inoculant that resulted in significant production gains in Brazil's Northern and Northeastern regions. Then, Embrapa Agrobiology decided to introduce and encourage the use of this technology in northern Ghana (Figure 2). This is the most important region for the production of cereals (corn, millet, sorghum and cassava) and grain legumes (cowpea, peanuts, soybeans) in the country, but its degraded soils lack nutrients, which limits crop growth. The first phase of the project showed that good quality inoculants improve nodulation and increase grain yield by 30% to 50%. Based on this finding, the second phase aims to promote increased cowpea, peanut and soybean production by small farmers in northern Ghana through the use of locally produced high quality rhizobia inoculants along with strategic phosphorus applications. Peanuts and soybeans are crops with high potential for export.

The Cotton Sector Development Support in Cotton-4 Countries Project (also called Cotton-4) is a technical cooperation initiative of the Brazilian government, coordinated by ABC and implemented by Embrapa with a contribution from public research institutions in Benin, Burkina Faso, Chad and Mali. Held between March 2009 and December 2013, this has been one of the largest Brazilian technical cooperation projects. Its main objective was to contribute to increased competitiveness of the cotton production chain of the four partner African countries.

Cotton is a commercial crop that significantly impacts agricultural development and poverty reduction in West Africa. In Benin, Burkina Faso and Mali, cotton accounts for 30%, 80% and 85% of the total agricultural export value respectively, and the three countries are among the ten largest exporters in the world. In this context, Cotton-4 aimed to support the development of cotton crops in all four countries by increasing productivity, increasing genetic diversity and improving product quality. These benefits tend to affect competitiveness in the global cotton market because it is a sector with broad export potential. Among the main results, the following stand out: using and adapting Brazilian cultivars, advancing production potential under no-tillage experimental conditions, and training researchers, technicians and leading farmers in new cotton production technologies (Centro de Estudos e Articulação da Cooperação Sul-Sul, 2015).

Photos: Robert Boddey

Figures 2. Experimental cowpea production areas in Ghana.

Final considerations

Accessing technologies and knowledge can undeniably be a significant contribution to expanding the agricultural production capacity in the least developed countries and, thus, to producing exportable surpluses. However, increasing these countries share in world exports also requires a wide range of initiatives. In order to export, a competitive production is needed, and it depends on storage and logistics infrastructure, public policies and institutions jointly acting in favor of exports, in addition to internal conditions favorable to production (inputs, processes, costs and quality). Other important issues include opening up international markets, linking countries and signing international agreements.

Despite the limited potential of technological advances to boost exports, scientific and technological development can be a bridge for trade between two worlds by opening up opportunities for cooperation and commercial development in low per capita income countries. By establishing global partnerships, many possibilities for growth open up (such as exploring synchronized food production seasonality), so that, together, partners are able to supply consumer markets and even share export and marketing facilities in importing countries. This is the real case of cashew production, whose crop in Africa coincides with off-season in Brazil; or that of mango, whose harvesting season in Africa and Central America takes place when Brazil has no fruit to offer. Such actions result in joint wealth and food security. This is a tangible challenge, and Embrapa could greatly contribute to jointly advancing knowledge and sharing technologies so that products could reach similar quality and homogeneity levels, regardless of their geographical origin. Other parties would be needed to minimize bottlenecks in funding, negotiation, logistics and storage processes.

The experiences reported here and others show that Embrapa can share technologies and knowledge through technical cooperation, and can organize and coordinate actions. To this date, in partnership with dozens of institutions, Embrapa has contributed to developing and improving the agricultural production capacity of least developed countries by establishing bases for production, productivity gains and value added products. This action allows these countries to progress in a continuum that begins with poverty reduction and food security and reaches surplus production. These initiatives are examples of the potential of global partnerships for sustainable development.

References

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